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Author

Van Way, Valerie

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APPROACHES TO COOT MANAGEMENT IN CALIFORNIA

VALERIE VAN WAY, Medical Toxicology Branch, Pest Management Division, California Department of Food and Agriculture, Sacramento, California 95814.

ABSTRACT: Coot depredations have been documented in California since 1886, and shooting has been relied on as the principal means of mitigating damage. Immobilizing agents continue to offer promise as useful nonlethal tools for population reduction programs. Exploration of the use of tribromoethanol in coot capture is described, and the potential for other bird management techniques is discussed.

BIOLOGY

The American Coot, or mudhen (*Fulica americana*), belongs to the Rail family, Rallidae, and under Federal Migratory Bird Regulations is classified as a migratory bird. Year-round, coots are found throughout the state. During winter, numbers increase significantly from the influx of Pacific flyway migrants, especially in saltmarshes, lakes, suburban or urban ponds, showing preference for shallow bodies of water. In 1955, the number of coots tallied among overwintering waterfowl was 534,000 birds, and this figure was thought to represent half of the actual coot population.

In California this species holds nongame status, primarily because of poor taste appeal, which is very likely due to the bird's food preferences. Not as attractive for human consumption as more abundant, more palatable species, this bird is still precluded game status in this state, although other states do include coots in their bagging limit.

Coots consume principally aquatic plants, mostly by surface feeding, though they can dive to 25 feet. Pondweeds and naiads comprise the bulk of their diet (approx. 90%), with snails and mollusks taking up the major portion of animal matter preference. If readily available, birds may eat grain set out for migrating ducks. In addition, coots accept handouts of bread, popcorn, fruit cores, fish bait, etc., when near human habitation.

DAMAGE

When aquatic vegetation is sparse or lacking, flocks may wander onto adjacent ground, grazing like geese and pulling up sprouting vegetation. Coot feet are unique; flap-like scales on the legs and feet enable efficient movement in water similarly as webbed feet of other birds do. When birds go onto ground, however, these scale-like appendages fold back so the birds can walk easily. In addition, their relatively sharp claws or nails (such as other gallinaceous birds, e.g., chicken, have) are excellent tools for rooting up insects and sprouts from the soil. So coots' ability to move easily from water to land, consume a wide variety of food items, and vigorously rogue and clip vegetation and animal matter wherever they wander have also enabled them to cause serious depredations to agricultural crops, damage to landscaping from intense clipping of grass or "puddling" of growth and turf areas near water, and contamination of water quality by excessive fecal deposition in reservoirs and smaller bodies of water.

California hosts up to three-fourths of the Pacific Flyway waterfowl, and in the early 1940s crop depredations became so acute that the California Farm Bureau, in a survey of rice fields throughout the state, reported in 1941 a loss of over 200,000 cwt. of cultivated rice (*Oryza sativa*). The original marsh areas of the Sacramento-San Joaquin River delta, now diked, drained, and devoted to intensive farming, still attracted waterfowl into sloughs and adjacent overflow areas. Shrinkage of waterfowl habitat was accompanied by increased concentrations of birds in agricultural crops.

In 1944, Samuel E. Piper, in a California Department of Food and Agriculture (CDFA) report, summarized the extent of coot damage to crops in data gathered through the County Agricultural Commissioners from 157 growers within California who had experienced noteworthy depredations. He identified and described the wide variety and intensity of this damage. Coots and other migratory waterfowl were impacting ladino clover and various grains heavily in counties along the Pacific Flyway, in a dollar amount estimated around \$219,060. San Joaquin, Merced, and Butte Counties reported the heaviest losses. The earliest record of damage attributable to coots was reported in an 1885 letter from a Modesto grower taken from the Biological Survey files. In this report, population reduction by shooting with shotgun was deemed the most practical method.

Worth noting about the time of Piper's report is that wildlife refuges for migrating birds had not yet been established in California; problems of bird depredations to grain growers in the flyway path were just then being fully identified. Information in Piper's report contributed significantly toward establishing refuges in California for migratory waterfowl management.

METHODS

Shooting

Seasonal coot invasions in grain crops or in relatively wild, remote areas have been handled often in a relatively cost-effective and efficient manner by shotgun capture. The County Agriculture Department of Los Angeles, for example, uses this method of retrieval in areas negatively impacted by coots. For example, approximately 3,000 birds were killed in 1984 within 15 manhours and an estimated \$500 worth of shotgun shells. Birds are collected immediately and disposed at a nearby landfill. A report is submitted to U.S. Fish and Wildlife Service every year, as stipulated in the depredation permit, summarizing the total number of each bird species taken. Relatively few nontarget birds are taken by this method.

However, intrusions in the urban setting, such as recreational facilities or nearby human habitation, present circumstances in which shooting has become a less-than-satisfactory control method. Consideration of safety hazards is one drawback, but public sentiment and reaction can seriously affect the acceptance and success of any population reduction program. Involved agencies are becoming acutely aware of this, and are now actively seeking more discrete and/or nonlethal methods of bird retrieval from areas subject to high public exposure. Success in any one approach thus far has proved limited, but many methods are still available and need to be explored, either singly or in combination.

Netting

Netting can be used in many types of approach: exclusion, live-trapping singly or in bulk, passive-trapping, etc. One method thought to offer promise was the cannon-net, used successfully on other waterfowl in California.

The cannon-net consists of a 30' by 60' net, 1 1/4" mesh, weighted on two sides with leaded weights and anchored on one end. Three rocket tubes (\$75.00 ea) hold mortar charges (\$2.75 ea), which are set off by an ignition device (\$350.00), which takes the netting into the air very quickly (initial velocity approximately 200 fps), until weights on the net bring it down over the target aggregation of birds. The Los Angeles County Department of Agriculture purchased a cannon net in hopes of removing coots effectively from a recreational reservoir with minimal disruption to the public, but the best of any attempt achieved a capture of only 25 birds. Set-up time, repeated attempts that would be required vs. the timid nature of coots in returning to a given area right after being disturbed, and safety hazards involved with mortar charge use have shown this approach to be expensive, time-consuming, and equally disruptive in terms of noise/hazards compared with shooting by shotgun.

Butterfly net type capture was briefly tried during the daytime in 1983 in Irvine, California, with only 1 bird captured within 2 1/2 hours. Nightlight capture has not been attempted.

Mist netting has been considered, only very briefly, because available mesh size and weight are very light for humane capture of this size and weight of bird. Moreover, coots do not fly readily, and mist nets are designed to capture birds in flight. However, a heavier weight and mesh size of netting may exist that could be manipulated or dropped horizontally upon coots herded into a fairly well-defined area.

Coots will frequent a predetermined area where food is set out regularly, and this behavior of the birds was used to significant advantage in taking birds with the assistance of sedatives or anesthetics by Woodbridge Village Association (WVA).

Anesthetics

In 1981 WVA, a private residential concern in Irvine, California, sought to find a permanent solution to the annual fall migration of large groups (2,000 to 3,000 of coots, mostly) of waterfowl to their lakes. Little natural food was available to coots and ducks from the man-made lakes, and birds would quickly move onto adjacent landscaping and green belt areas for feeding. Buildup of birds in the lakes would cause fecal deposits along lakefront edges to imbalance lake ecology from phosphate contamination. The Association felt that the bird population was excessive for the area to bear, and consulted with Dr. Phil Taylor, UC Irvine, to determine whether any of these problems could be alleviated. His recommendations confirmed that some steps could be taken to better the situation, and the WVA, through the representation of Jay Howard, Manager of Operations, then contacted U.S.F.W.S. and California Department of Fish and Game (CDFG) to obtain required permission to remove the coots.

In this instance approval was needed from both regulating agencies because the manner in which birds were proposed to be taken departed from the Code of Federal Regulations provisions (shooting) for this depredating species. Permission from each agency was given; each stipulated conditions which varied with each agency's wildlife management concerns. The U.S.F.W.S. Denver Wildlife Research Center has experimented with sedatives on various species of birds under tightly controlled conditions. Research findings are available in the literature. Three compounds in particular show potential as immobilizing agents.

Tribromoethanol and alpha-chloralose have both been around for a long time and have been shown effective on pigeons and some waterfowl. Methoxymol is a recently explored agent which acts more quickly and is shorter lasting. Use as a pesticide has not been pursued because of registration cost involved for such low benefit from limited use. Tribromoethanol had briefly been used as a human sedative under the trade name Avertin.

Anesthetics were proposed for the capture of problematic birds at Woodbridge Village Association because shooting seemed undesirable in the lakes area, which had high public exposure. Netting by hand had been attempted but only 1 bird was captured in a 2 1/2-hour period. Available information suggested sedatives might be applicable to that situation. The services of a veterinarian were retained to supervise the administration of anesthetic and disposal of captures. Law allows regulated substances to be handled by people approved to administer such substances, such as veterinarians, or by those under their close supervision.

The veterinarian and the WVA selected sodium amobarbital to be used, but sodium pentathol proved more easily available and reasonable in cost (\$400/lb). This material was allowed to soak up into diced (1-in. cubes) white bread and presented to the birds accustomed to being fed in well-defined areas on the lakefront. Accurate records were kept of the number of birds taken in each application. More ducks were taken early in the season, but as these became fewer in number compared with coot numbers, the number of coots gradually increased. The California Department of Food and Agriculture became interested when it became aware of the capture program, and donated 1 pound of tribromoethanol from stores in Riverside. This compound had been used by CDFA on field trials with pigeons some years before with inconclusive results.

It soon became apparent that no positive pattern of results could be established by the different drugs. At times 35 to 40 coots could be taken in a day, yet on other occasions only 2 or 3 were taken. The highest number retrieved in one presentation was 80 birds. Sometimes all the bait was consumed at the site where it was offered. Often ducks would show up and eat all the food, scaring coots off by their presence. In some instances the ducks overdosed and would not recover. These birds were also collected and euthanized in the same manner as the coots, as is stipulated under conditions of the CDFG permit. If the ducks moved away, coots would then come in to feed.

Substitution of chicken scratch in place of white bread made bait easily taken up by coots. On one day, alfalfa sprouts were added to the bait mixture to determine whether coot preference for sprouting vegetation enhanced uptake of bait particles. None was observed. Temperature was thought to influence the susceptibility of coots to the bait, but it was difficult to isolate this factor from the many other variables that were involved.

Tribromoethanol (TBE) had been available initially at \$275/kg material in orders of 4.0 kg or more. This was reasonable compared with the other sedative prices so tribromoethanol was used for the remainder of the season. The following year, however, prices were increased 300%, and consideration of this material was dropped immediately.

When tribromoethanol was found more soluble in alcohol, bait preparation involved establishing solubility first before mixing into scratch. The mixing procedure at WVA was refined into the recipe that follows:

- 1) Soak 5 lbs of chicken scratch feed in water for 5 hours. Decant.
- 2) Mix TBE in 1/2 pint ethyl alcohol and pour over scratch. Add water as needed to cover scratch.
- 3) Soak 300 g 12 hours.
- 4) Decant mix and air dry overnight - spread out on plastic sheet.

ALTERNATIVE METHODS

Vegetation management might be employed in certain field crop situations; it would not be possible, however, in a golf course water hazard. (Damage assessment \$ due to coots has yet to be described, and yet is commonly accepted throughout the state.) Barrier netting along lake edges or within a close distance from lake edge could take advantage of coots' reluctance to fly and discourage birds from certain portions of lake edge and/or be used to herd birds to a designated baiting or trapping area. Some trap designs for waterfowl could be modified to take advantage of coots' flocking habit and ability to be manipulated by bait.

Nighttime hand netting with high-intensity lights has been used successfully in other states.

These are only a few approaches that need to be explored during the coming years, when urban growth in California is likely to increase the urban interface/encroachment problem. Understanding what each technique has to offer will be of benefit in developing practical coot and possibly other pest bird management programs, especially in areas of high urban public exposure.

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